



APR 1/11

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Bruce E. Kramer et al.

U.S. Application No.: 10/033,775

Confirmation No.: 8566

Group Art Unit: 3764

Filed: January 3, 2002

Examiner: Stephen R. Crow

For: Treadmill

SUBMISSION OF APPEAL BRIEF

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Appellants submit herewith their appeal brief. Attached is a check for the fee of \$20.00 (per MPEP 1204.01, \$270.00 small entity Appeal Brief submission fee - \$250.00 small entity Appeal Brief submission fee previously paid on April 26, 2007).

Respectfully submitted,

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Date: December 8, 2008

Adjustment date: 12/10/2008 JAD001
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04/27/2008 SZENDIE1 00000003 10033775
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS AND INTERFERENCES**

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APPEAL BRIEF

Mail Stop Appeal Brief - Patents

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P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

Further to the Notice of Appeal filed November 10, 2008, Appellants submit this appeal brief for the Board's consideration.

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REAL PARTY IN INTEREST

The real parties in interest are the inventors, Bruce E. Kramer and Joy E. Belin.

RELATED APPEALS AND INTERFERENCES

Appellants do not know of any prior or pending appeals, interferences or judicial proceedings which may be related to, directly affect, or be directly affect by or have a bearing on the Board's decision in the pending appeal.

STATUS OF CLAIMS

Claims 1, 5-7, 10-13, 17-19, and 22-26 are rejected and are being appealed.

STATUS OF AMENDMENTS

No amendments were filed after the Final Office Action of August 15, 2008.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed to a treadmill comprising a base 22, a pair of parallel, spaced rollers 24 and 26 rotatably disposed in the base, and an endless belt 28 extending around both rollers, wherein the belt has a width which is large enough to accommodate two treadmill users side-by-side, wherein the two treadmill users are two adult people, wherein the treadmill further comprises a control panel 36 for a treadmill user on the treadmill. See, e.g., page 4, line 14 to page 5, line 8, page 8, line 21 to page 9, line 17, and Fig. 1 in the present application.

Independent claim 7 is directed to a treadmill comprising a base 22, two pairs of parallel, spaced rollers 241 and 261, and 242 and 262, rotatably disposed in the base, and two endless belts 281 and 282, wherein one belt 281 extends around both rollers in one pair of rollers 241 and 261 and the other belt 282 extends around both rollers in the other pair of rollers 242 and 262, wherein each belt has a width which is large enough to accommodate one treadmill user, and wherein the two belts are positioned to accommodate two treadmill users side-by-side, wherein each belt has a width which is large enough to accommodate an adult person. See, e.g., page 3, lines 10-15, page 5, lines 13-18, page 6, lines 9-10, the paragraph inserted before the last paragraph on page 11 (see the Amendment filed September 26, 2005), and Fig. 2 (see the Amendment filed September 26, 2005).¹

¹ While Appellants believe that the amendments filed September 26, 2005 are adequately supported by the disclosure in the specification as originally filed (e.g., the disclosure at page 5, lines 13-18), in the event they are considered to be new matter as alleged by the Examiner Appellants simply refer the Board to, e.g., the disclosure at page 3, lines 10-15, and page 5, lines 13-18 in connection with independent claim 7.

Independent claim 13 is directed to a method for two treadmill users to exercise side-by-side on a single treadmill, comprising

providing a treadmill comprising a base, a pair of parallel, spaced rollers rotatably disposed in the base, and an endless belt extending around both rollers, wherein the belt has a width which is large enough to accommodate two treadmill users side-by-side, wherein the two treadmill users are two adult people, and

moving the belt to exercise two treadmill users positioned side-by-side on the belt. See, e.g., page 3, lines 16-21, page 5, lines 6-8, and page 8, lines 8-12.

Independent claim 19 is directed to a method for two treadmill users to exercise side-by-side on a single treadmill, comprising

providing a treadmill comprising a base, two pairs of parallel, spaced rollers rotatably disposed in the base, and two endless belts, wherein one belt extends around both rollers in one pair of rollers and the other belt extends around both rollers in the other pair of rollers, wherein each belt has a width which is large enough to accommodate one treadmill user, and wherein the two belts are positioned to accommodate two treadmill users side-by-side, wherein each belt has a width which is large enough to accommodate an adult person, and

moving the belts to exercise two treadmill users positioned side-by-side on the belts. See, e.g., page 3, line 22 to page 4, line 6, page 6, lines 9-10, and page 8, lines 13-20.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Claims 6-7, 10-12, 18-19, and 22-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Moon et al.

Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kelsey et al.

Claims 1, 5, 13, 17, 18, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al in view of Derksen.

Claims 1, 5, 13, 17, 18, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelsey et al.

ARGUMENT

Rejection of Claims 6-7, 10-12, 18-19, and 22-26 under 35 U.S.C. 112, First Paragraph

On page 3 of the Office Action of August 15, 2008, claims 6-7, 10-12, 18-19, and 22-26 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The Examiner's Position

The Examiner's position is that the pair of endless belts and other structure claimed in claims 6-7, 10-12, 18-19 and 22-26 are not described and shown by the disclosure.

Further, on page 6 of the Office Action, the Examiner indicates that the original specification does not support an element 54 which is linear and which extends orthogonally away from a middle portion of the handlebar 46. The Examiner indicates that handle 54 is not integral with the handlebar 46 and handle 54 is not in the "middle portion"; rather, handle 46 possesses a middle portion which cannot be seen due to the display. The Examiner indicates that handle 54 is a separate handlebar.

In addition, the Examiner indicates that Fig. 2 is defective because it fails to teach main things, namely, whether the belts are equal sized and how the extra pair of rollers is supported on the frame. The Examiner indicates that Appellant has introduced a central support between the pair of treadmills for supporting the rollers, and that this structure lacks support in the specification.

The Examiner indicates that the adage "a picture is worth a thousand words" is applicable here, and in most cases, a drawing is more detailed than the written disclosure.

Further, in his supplemental remarks, the Examiner indicates on page 7 of the Office Action that there are several elements shown in Fig. 2 which do not necessarily follow from the specification as originally filed and thus are considered new matter, including with respect to handlebar element 54. In this regard, the Examiner indicates that it isn't a case of whether one would understand that the handlebar would extend perpendicularly and linearly from the middle of the main handle, nor that the extra pair of rollers can be supported on the frame in the manner shown in Fig. 2 but not Fig. 1. The Examiner further indicates that this structural arrangement isn't "readily envisioned by one skilled in the art", contrary to Appellants' assertion.

Appellants' Response

In response, Appellants submit that the present claims satisfy the requirements of 35 U.S.C. 112, first paragraph, and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

Claims 7, 10-12, 18-19 and 22-26

In response, Appellants submit initially that contrary to the Examiner's position, the pair of endless belts and other structure recited in the claims are described and shown in the specification at, e.g., in the description from page 5, line 13 to page 6, line 16 and in the description in the last paragraph on page 7 in the application. Further, Appellants submit that this disclosure is sufficient, particularly when the knowledge in the art is considered, even without considering the drawings in the present case.

In this regard, with respect to the knowledge in the art as to how the extra pair of rollers is supported on the frame, Appellants note that in the Office Action of January 10, 2006, the Examiner himself cited references which teach dual-type treadmills (see

paragraph 3 on page 5 of the January 10, 2006 Office Action, as well as the references listed on the PTO-892 form attached to that Office Action). For instance, Fig. 2 in U.S. Patent 5,607,376 and Fig. 1 in U.S. Patent 4,204,673 together with the associated disclosure in each of those patents is evidence of the knowledge in the art as to how an extra pair of rollers is supported on a frame (see the attached copies of U.S. Patents 5,607,376 and 4,204,673). As set forth in MPEP 2164.05, an Appellant may cite references to show what one skilled in the art knew at the time of filing the application. Further, as set forth in MPEP 2164.05(a), the specification need not disclose what is well-known to those skilled in the art and preferably omits that which is well-known to those skilled and already available to the public. *In re Buchner*, 929 F.2d 660, 661 18 USPQ2d 1331, 1332 (Fed. Cir. 1991), *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384, 231 USPQ 81, 94 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987); and *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1463, 221 USPQ 481, 489 (Fed. Cir. 1984).

Appellants submit that element 54 (relevant to claims 12 and 24, which are supported by the disclosure at page 7, lines 4-17) is supported by, e.g., the disclosure at page 7, lines 13-17 in the original specification. From this description, Appellants submit that one skilled in the art would readily envision an element 54 that is linear and extends orthogonally away from a middle portion of the handlebar 46. While the Examiner indicates that handle 54 is not integral with the handlebar 46 and that handle 54 is not the "middle portion" but rather handle 46 possesses a middle portion which cannot be seen due to the display and handle 54 is a separate handlebar, Appellants submit that one skilled in the art would readily envision middle portion 54 based on the description in the

last paragraph on page 7 in the application and would understand that middle portion 54 is connected to the middle part of handle bar 46, as discussed at page 7, lines 13-14. In this regard, Appellants submit that the Examiner is confusing "middle portion" with "middle part" as those terms are used in the specification, e.g., in the last paragraph on page 7.

In regard to Fig. 2, Appellants submit that the answers to the issues raised by the Examiner, namely, whether the belts are equal sized and how the extra pair of rollers is supported on the frame, would be readily understood by one skilled in the art in view of the aforementioned disclosure at page 5, line 13 to page 6, line 16, and the knowledge in the art (e.g., Fig. 2 in U.S. Patent 5,607,376 and Fig. 1 in U.S. Patent 4,204,673 together with the associated disclosure in each of those patents), as discussed above.

With respect to the Examiner's indication that the adage "a picture is worth a thousand words" is applicable here and that in most cases a drawing is more detailed than the written disclosure, Appellants again submit that the figures in the present application are supported by, e.g., the written disclosure on pages 5-7 as discussed above, particularly when that disclosure is considered in view of the skill in the art, as discussed above.

As to the Examiner's indication that the drawing changes added new matter, Appellants respectfully disagree and submit that the drawing changes are supported by the specification as originally filed, including the disclosure at page 5, line 13 to page 6, line 16 and in the description in the last paragraph on page 7 as discussed above. With respect to the Examiner's indication that the "readily envisioned by one skilled in the art" argument is subjective, Appellants disagree and submit that one skilled in the art considering the disclosure in the present specification together with the knowledge in the

art (such as U.S. Patents 5,607,376 and 4,204,673 discussed above) would be able to readily envision the claimed invention. Regarding the Examiner's question as to how the new subject matter is readily envisioned by the prior art if the prior art doesn't teach the claimed invention, Appellants submit that the subject matter at issue is readily envisioned by the disclosure in the present specification taken together with the knowledge in the art. As to the Examiner's indication that it still remains unclear how one would realize the linear, horizontal element of the proposed drawing in addition to how it would be attached to the handle bar 46 from a reading of the specification, Appellants submit that the description in the last paragraph on page 7 in the specification (including the disclosure that the middle portion can extend back from a middle part of the front portion and that, when not desired, the middle portion either can be pivoted so that it hangs down from the front portion or can be removed) is sufficient to describe the linear, horizontal element of the proposed drawing in addition to how it would be attached to the handle bar 46.

Claims 6 and 18

Appellants submit that claims 6 and 18 are adequately described in a manner similar to that discussed above with respect to claims 12 and 24, except that the issue of the pair of belts and other structure recited in independent claims 7 and 19 does not arise since claims 6 and 18 depend from claims 1 and 13, respectively (in contrast to claims 12 and 24, which depend from claims 7 and 19, respectively). See, e.g., page 7, lines 4-17 for disclosure supporting claims 6 and 18.

In addition, Appellants submit that element 54 in Fig. 1 is supported by, e.g., the disclosure at page 7, lines 13-17 in the original specification. From this description, Appellants submit that one skilled in the art would readily envision an element 54 that is linear and extends orthogonally away from a middle portion of the handlebar 46. While the Examiner indicates that handle 54 is not integral with the handlebar 46 and that handle 54 is not the "middle portion" but rather handle 46 possesses a middle portion which cannot be seen due to the display and handle 54 is a separate handlebar, Appellants submit that one skilled in the art would readily envision middle portion 54 based on the description in the last paragraph on page 7 in the application and would understand that middle portion 54 is connected to the middle part of handle bar 46, as discussed at page 7, lines 13-14. In this regard, Appellants submit that the Examiner is confusing "middle portion" with "middle part" as those terms are used in the specification, e.g., in the last paragraph on page 7.

Further, Appellants submit that the description in the last paragraph on page 7 in the specification (including the disclosure that the middle portion can extend back from a middle part of the front portion and that, when not desired, the middle portion either can be pivoted so that it hangs down from the front portion or can be removed) is sufficient to describe the linear, horizontal element of the proposed drawing in addition to how it would be attached to the handle bar 46.

Thus, Appellants submit that claims 6-7, 10-12, 18-19, and 22-26 satisfy the requirements of 35 U.S.C. 112, first paragraph, and reversal of this rejection is respectfully requested.

Anticipation Rejection over Moon et al

On page 4 of the Office Action of August 15, 2008, Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Moon et al.

In response, Appellants note initially that claim 1 recites a treadmill having an endless belt which is wide enough to accommodate two treadmill users side-by-side, wherein the two treadmill users are two adult people.

Appellants submit that Moon does not teach or suggest such a wide belt, and Appellants note that the Examiner has still not identified the specific disclosure in Moon which he considers anticipatory, despite the specific request made page 12 in the Amendment filed February 6, 2008.

In this regard, Appellants note that MPEP 2125 states that when a reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. See *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000) (The disclosure gave no indication that the drawings were drawn to scale. "[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.").

With respect to the Examiner's indication on page 6 of the Office Action that the language "adult people" doesn't recite specific dimensions and that adult humans come in various sizes, such as dwarfs who are abnormally small, Appellants submit that such an

interpretation is unreasonable and is not the interpretation that one skilled in the art would give to the terminology at issue. In this regard, Appellants note that the recitation of two adult people was originally recited in claim 2, which depended on claim 1 and recited that the belt has a width which is large enough to accommodate two adult people side-by-side. Claim 1 recited that the belt has a width which is large enough to accommodate two treadmill users side-by-side. For claim 2 to be a proper dependent claim and further limit claim 1, the recitation in claim 2 of two adult people side-by-side would need to result in a belt which is wider than the minimum width belt which could accommodate two treadmill users side-by-side. Thus, Appellants submit that the Examiner has not fairly interpreted the recitation of adult people in claim 1.

In view of the above, Appellants submit that the present invention is not anticipated by (or obvious over) either Moon. Accordingly, reversal of this rejection is respectfully requested.

Anticipation Rejection over Kelsey et al

On page 4 of the Office Action of August 15, 2008, Claim 1 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Kelsey et al.

In response, Appellants again note that claim 1 recites a treadmill having an endless belt which is wide enough to accommodate two treadmill users side-by-side, wherein the two treadmill users are two adult people.

Appellants submit that Kelsey et al does not teach or suggest such a wide belt, and Appellants note that the Examiner has still not identified the specific disclosure in Kelsey

et al which he considers anticipatory, despite the specific request made page 12 in the Amendment filed February 6, 2008.

In this regard, Appellants note that MPEP 2125 states that when a reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. See *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000) (The disclosure gave no indication that the drawings were drawn to scale. "[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.>").

With respect to the Examiner's indication on page 6 of the Office Action that the language "adult people" doesn't recite specific dimensions and that adult humans come in various sizes, such as dwarfs who are abnormally small, Appellants submit that such an interpretation is unreasonable and is not the interpretation that one skilled in the art would give to the terminology at issue. In this regard, Appellants note that the recitation of two adult people was originally recited in claim 2, which depended on claim 1 and recited that the belt has a width which is large enough to accommodate two adult people side-by-side. Claim 1 recited that the belt has a width which is large enough to accommodate two treadmill users side-by-side. For claim 2 to be a proper dependent claim and further limit claim 1, the recitation in claim 2 of two adult people side-by-side would need to result in a belt which is wider than the minimum width belt which could accommodate two treadmill users side-by-side. Thus, Appellants submit that the Examiner has not fairly interpreted the recitation of adult people in claim 1.

In view of the above, Appellants submit that the present invention is not anticipated by (or obvious over) either Kelsey et al. Accordingly, reversal of this rejection is respectfully requested.

Obviousness Rejection over Moon et al in view of Derksen

On page 4 of the Office Action of August 15, 2008, claims 1, 5, 13, 17, 18 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon et al in view of Derksen.

The Examiner's Position

The Examiner indicates that Moon et al teaches all of Appellants' claimed invention except for the specific widths claimed. The Examiner's position is basically that in view of the well recognized use of treadmills for training horses as shown in Derksen, it would have been obvious to enlarge the Moon et al treadmill to any desirable width for accommodating any desired animal for exercise purposes. The Examiner indicates that Derksen is considered to be from an analogous art as Moon, since both include rollers and belts and therefore inherently have belt widths, and both are used to exercise mammals for a gaiting type exercise. The Examiner indicates that an enlarged treadmill width would be desired to accommodate extremely large persons or animals and is considered a design choice that carries no patentable weight. As to the method claims, the Examiner indicates that such a sized treadmill could be used for any desired function, such as accommodating plural animals. The Examiner indicates that Appellants have merely taken Moon's Figure 1 treadmill and made it wider, and the Examiner asserts that

where a change in size of a prior art reference merely represents a change in degree, and not a change in kind, such a change is a design consideration within the skill of the art.

Appellants' Response

Appellants respectfully submit that the present invention is not obvious over Moon et al in view of Derksen, and request that the Board reverse this rejection in view of the following remarks.

Claims 1, 5, 13, 17, 18, and 22-26 Overall

(1) Appellants submit that one of ordinary skill in the art would not have combined Moon et al and Derksen.

Specifically, Moon et al is directed to a treadmill having a control panel positioned in such a manner as to minimize the likelihood of a user's foot striking a forward part of the treadmill's stationary base when the user is accessing the control panel (see, e.g., col. 1, lines 20-35). Thus, the Moon et al treadmill is directed to a user who would be on the treadmill and accessing the control panel.

In contrast, Derksen is discloses a treadmill used by a horse.

Since a horse is not a treadmill user that would be accessing a control panel, one of ordinary skill in the art would not have applied the teachings of Derksen to Moon et al.

That is, one of ordinary skill in the art would not have made the belt of the Moon et al treadmill wide enough to accommodate a horse, because the Moon et al treadmill, with its specifically positioned control panel, is not intended to be used by a horse.

Rather, the Moon et al treadmill is intended to be used by a person, since a person is a user who would access a control panel. That is, the desired animal using Moon for exercise purposes is a person, and thus one would not modify Moon to suit a horse.

In this regard, as can be seen from the use of treadmills with standard sized belts by extremely large people in fitness clubs, an extremely large person can use a treadmill with a standard sized belt. Since an extremely large person can use a treadmill with a standard sized belt in a fitness club, one of ordinary skill in the art would not have been motivated to enlarge the belt in Moon et al, particularly since such would have added to the cost of the Moon et al treadmill.

Thus, one of ordinary skill in the art would not have modified Moon in view of Derksen, and that claims 1 and 13 and the claims dependent thereon are not obvious over Moon et al in view of Derksen accordingly.

(2) With respect to the Examiner's indication that the size change is a matter of degree, not kind, and that it does not produce a new form of exercise equipment but rather the size change merely enlarges the size of the treadmill, Appellants submit that their wider treadmill is not merely a change in degree, but rather is a change in kind and produces a new form of exercise equipment. In this regard, Appellants submit that their wider treadmill enables a completely new form of treadmill exercising, namely, exercising by two adult treadmill users side-by-side on the same treadmill, which is neither taught nor suggested by either Moon or Derksen. Since the present invention provides a completely new form of exercising, Appellants submit that it is a change in kind. Indeed, Appellants submit a treadmill which results in a completely new form of treadmill exercising represents a new form of exercise equipment and thus is a change in kind for this additional reason.

The invention product permits two adult treadmill users to exercise side-by-side while holding hands, which has not been possible previously, either in Moon or

elsewhere. Thus, the invention is directed to an entirely different market than that targeted by Moon, namely, companion exercisers rather than a solo exerciser. This is a change in kind, not a change in degree.

Additional Reasoning for Patentability of Method Claims 13, 17, 18, and 26

In regard to method claims 13, 17, 18, and 26 Appellants submit that these claims are also not obvious because the cited references neither teach nor suggest that more than one user can be using the treadmill at one time, and thus neither teach nor suggest the claimed method for exercising two adult treadmill users positioned side-by-side on the belt of a treadmill. Accordingly, even if the belt in Moon et al were wide enough to accommodate plural animals (which Appellants submit would not have been the case, as discussed above), there is still no teaching or suggestion in the cited art which would lead one to have actually exercised plural animals on such a belt.

That is, with respect to the Examiner's assertion that a modified version of Moon could be used for any desired function, such as accommodating plural animals, Appellants submit that the function of accommodating plural animals was not recognized at all in either Moon or Derksen (the Moon treadmill is intended to be used by one person at a time, and the Derksen treadmill is intended to be used by one horse at a time), let alone be recognized as a desired function, so one would not have been led to the presently claimed method from Moon in view of Derksen.

With respect to Moon in particular, Appellants submit that Moon does not contemplate accommodating plural animals, and there is no reason why one of ordinary skill in the art would look to Moon to accommodate plural animals. Moon simply represents a standard sized treadmill, which one of ordinary skill in the art would

consider suitable for use by a single user. Two small adults would not use the Moon treadmill side-by-side because there is no teaching or suggestion to do such, and further that treadmill is too narrow and thus there would be a danger of falling and suffering injury.

Thus, Appellants submit that claim 13 and the claims dependent thereon are not obvious over Moon et al in view of Derksen for the above additional reasoning.

Further Reasoning for Patentability of Claims 18, 25 and 26 in Particular

As to claims 18, 25 and 26 in particular, Appellants submit that these claims are further patentable because the cited art combination neither teaches nor suggests an embodiment which includes a handle bar having a middle portion that can extend back from a middle part of the front portion of the handle bar. The middle portion can be grasped by the right hand of the left user and/or by the left hand of the right user of the claimed treadmill, and such is simply not contemplated by Moon et al and Derksen.

Further Reasoning for Patentability of Claims 22-24

Appellants note that claims 22-24 depend directly or indirectly on independent claim 19, which is not even included in this rejection. By virtue of their dependence on claim 19, claims 22-24 require two belts, which are neither taught nor suggested by Moon and Derksen. Thus, Appellants submit that claims 22-24 are patentable for this additional reason.

Therefore, Appellants submit that the present invention is not obvious over Moon and Derksen, and reversal of this rejection is respectfully requested.

Obviousness Rejection over Kelsey et al

On page 5 of the Office Action, claims 1, 5, 13, 17, 18, and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelsey et al.

The Examiner's Position

The Examiner's position is that Kelsey discloses a treadmill as depicted in Figure 2 having an adult male supported thereon, and the Examiner indicates that the Kelsey treadmill width in Figure 2 appears to be approximately 40-45 inches, based on the relative dimensions of the user and the treadmill. In this regard, the Examiner considers Figure 2 to be an accurate representation of the proportionality of the treadmill with respect to the user, and that it is proper to approximate the width of the treadmill given the proportional dimensions provided in Figure 2.

Appellants' Response

In response, Appellants note that as set forth above, MPEP 2125 states that when a reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value. See *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000) (The disclosure gave no indication that the drawings were drawn to scale. "[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.").

Appellants submit that Kelsey does not disclose that the drawings are to scale and is silent as to dimensions. Thus, Appellants submit that the Examiner's arguments based on measurement of the drawing features are of little value.

Appellants note that Kelsey is directed to a single person using a treadmill, and there is no reason why one would make the belt wide enough to be used by two treadmill users as in the present invention.

Additional Reasoning for Patentability of Method Claims 13, 17, 18, and 26

As to method claims 13, 17, 18, and 26 in particular, since Kelsey is directed to a single person using a treadmill Appellants submit that there is simply no teaching or suggestion in Kelsey of exercising two treadmill users side-by-side on a single treadmill, and thus the method claims are not obvious over the cited art for this additional reason.

Further Reasoning for Patentability of Claims 18, 25 and 26 in Particular

As to claims 18, 25 and 26 in particular, Appellants submit that these claims are further patentable because Kelsey neither teaches nor suggests an embodiment which includes a handle bar having a middle portion that can extend back from a middle part of the front portion of the handle bar. The middle portion can be grasped by the right hand of the left user and/or by the left hand of the right user of the claimed treadmill, and such is simply not contemplated by Kelsey.

Further Reasoning for Patentability of Claims 22-24

Appellants note that claims 22-24 depend directly or indirectly on independent claim 19, which is not even included in this rejection. By virtue of their dependence on claim 19, claims 22-24 require two belts, which are neither taught nor suggested by

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Kelsey. Thus, Appellants submit that claims 22-24 are patentable for this additional reason.

Therefore, Appellants submit that the present invention is not obvious over Kelsey, and reversal of this rejection is respectfully requested.

Conclusion

In view of the above remarks, Appellants submit that the present invention is patentable, and reversal of the rejections is respectfully requested.

Respectfully submitted,



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Date: December 8, 2008

CLAIMS APPENDIX

The claims involved in the appeal are as follows:

1. A treadmill comprising a base, a pair of parallel, spaced rollers rotatably disposed in the base, and an endless belt extending around both rollers, wherein the belt has a width which is large enough to accommodate two treadmill users side-by-side, wherein the two treadmill users are two adult people, wherein the treadmill further comprises a control panel for a treadmill user on the treadmill.

5. A treadmill as claimed in claim 1, wherein the belt has a width of at least 45 inches.

6. A treadmill as claimed in claim 1, wherein the treadmill has a handle bar comprising a front portion and left and right side portions, wherein the handle bar further comprises a middle portion which can extend back from a middle part of the front portion.

7. A treadmill comprising a base, two pairs of parallel, spaced rollers rotatably disposed in the base, and two endless belts, wherein one belt extends around both rollers in one pair of rollers and the other belt extends around both rollers in the other pair of rollers, wherein each belt has a width which is large enough to accommodate one treadmill user, and wherein the two belts are positioned to accommodate two treadmill users side-by-side, wherein each belt has a width which is large enough to accommodate an adult person.

10. A treadmill as claimed in claim 7, wherein the belts move independently of each other.

11. A treadmill as claimed in claim 10, wherein the belts can be inclined independently of each other.

12. A treadmill as claimed in claim 7, wherein the treadmill has a handle bar comprising a front portion and left and right side portions, wherein the handle bar further comprises a middle portion which can extend back from a middle part of the front portion.

13. A method for two treadmill users to exercise side-by-side on a single treadmill, comprising

providing a treadmill comprising a base, a pair of parallel, spaced rollers rotatably disposed in the base, and an endless belt extending around both rollers, wherein the belt has a width which is large enough to accommodate two treadmill users side-by-side, wherein the two treadmill users are two adult people, and

moving the belt to exercise two treadmill users positioned side-by-side on the belt.

17. A method as claimed in claim 13, wherein the belt has a width of at least 45 inches.

18. A method as claimed in claim 13, wherein the treadmill has a handle bar comprising a front portion and left and right side portions, wherein the handle bar further comprises a middle portion which can extend back from a middle part of the front portion.

19. A method for two treadmill users to exercise side-by-side on a single treadmill, comprising

providing a treadmill comprising a base, two pairs of parallel, spaced rollers rotatably disposed in the base, and two endless belts, wherein one belt extends around both rollers in one pair of rollers and the other belt extends around both rollers in the other pair of rollers, wherein each belt has a width which is large enough to accommodate one treadmill user, and wherein the two belts are positioned to accommodate two treadmill users side-by-side, wherein each belt has a width which is large enough to accommodate an adult person, and

moving the belts to exercise two treadmill users positioned side-by-side on the belts.

22. A method as claimed in claim 19, wherein the belts move independently of each other.

23. A method as claimed in claim 22, wherein the belts can be inclined independently of each other.

24. A method as claimed in claim 19, wherein the treadmill has a handle bar comprising a front portion and left and right side portions, wherein the handle bar further comprises a middle portion which can extend back from a middle part of the front portion.

25. A treadmill as claimed in claim 5, wherein the treadmill has a handle bar comprising a front portion and left and right side portions, wherein the handle bar further comprises a middle portion which can extend back from a middle part of the front portion.

26. A method as claimed in claim 17, wherein the treadmill has a handle bar comprising a front portion and left and right side portions, wherein the handle bar further

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comprises a middle portion which can extend back from a middle part of the front portion.

EVIDENCE APPENDIX

In the event that U.S. Patents 5,607,376 and 4,204,673 (relied upon by Appellants to show the knowledge in the art as to how an extra pair of rollers is supported on a frame) are considered to be evidence, copies of those patents are attached to this Appeal Brief. Those patents were entered into the record by the Examiner in the Office Action of January 10, 2006 (see the PTO-892 form attached to that Office Action).

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RELATED PROCEEDINGS APPENDIX

None.

[54] DUAL-TREAD EXERCISER

[76] Inventor: John Speer, Sr., 1425 Bedford St., Stamford, Conn. 06905

[21] Appl. No.: 969,438

[22] Filed: Dec. 14, 1978

[51] Int. Cl.² A63B 23/06

[52] U.S. Cl. 272/69; 128/25 R; 198/817; 272/129; 272/DIG. 4

[58] Field of Search 272/69, 70, 131, 132, 272/134, DIG. 4, 96, 97, 70.3, 116, 129; 128/25 R, 25 B; 198/817, 324; 104/25

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Primary Examiner—Richard C. Pinkham

Assistant Examiner—Arnold W. Kramer

Attorney, Agent, or Firm—Charles F. Gunderson

[57] ABSTRACT

Exercising devices include rotatable treads and arm supports for using both the arms and the legs, and some of the exercising devices, particularly of the treadmill type having continuous treads, are for the exercise of the legs in a walking manner and position, but in a static condition. All of the treadmill exercisers have a unitary frame having two treadmills with two continuous treads, one for each foot, and may have corresponding, separate, coordinated hand or arm exercising functions due to moveable hand braces.

10 Claims, 6 Drawing Figures

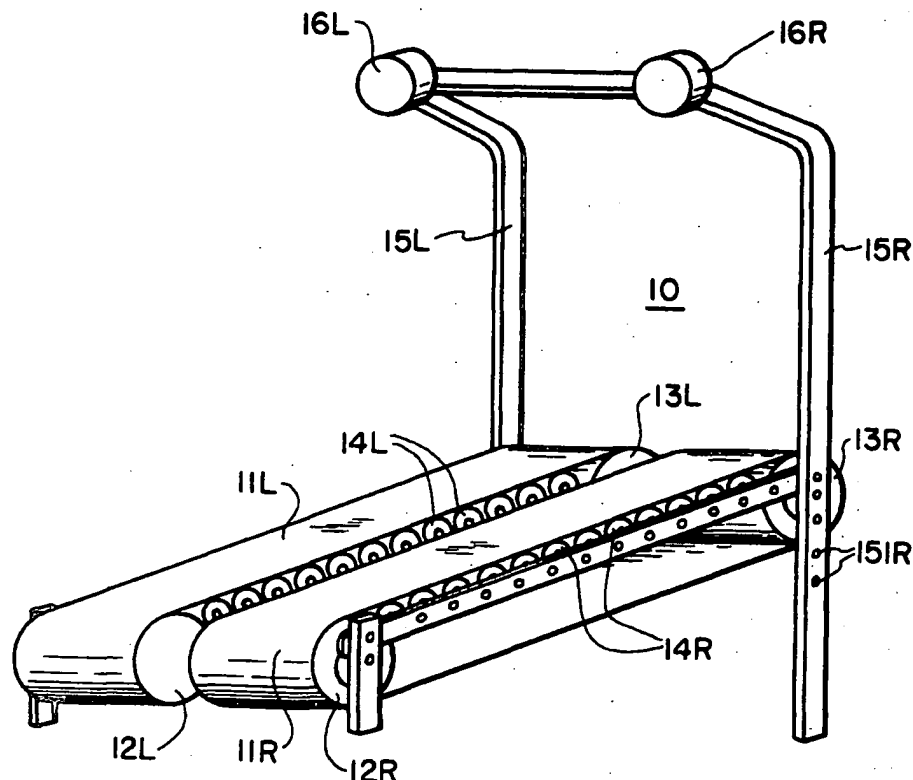


FIG. 2

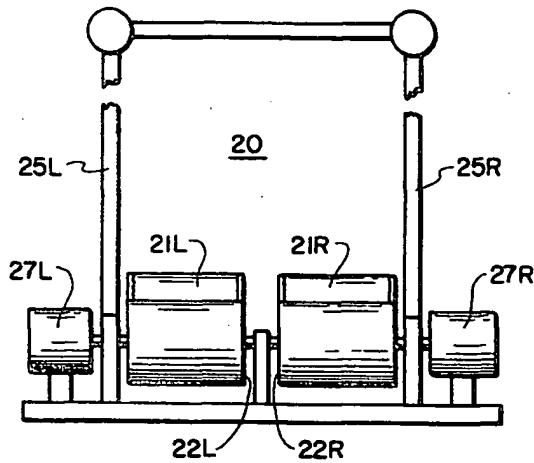


FIG. 1

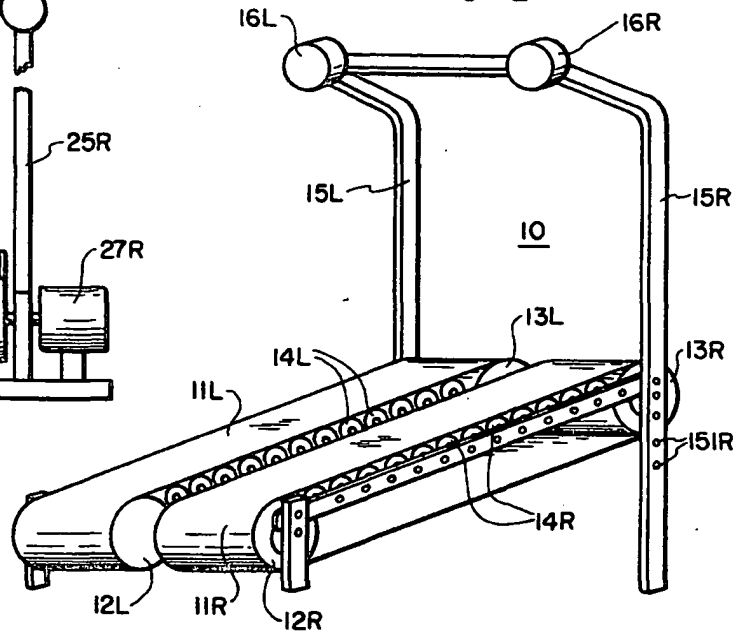


FIG. 3

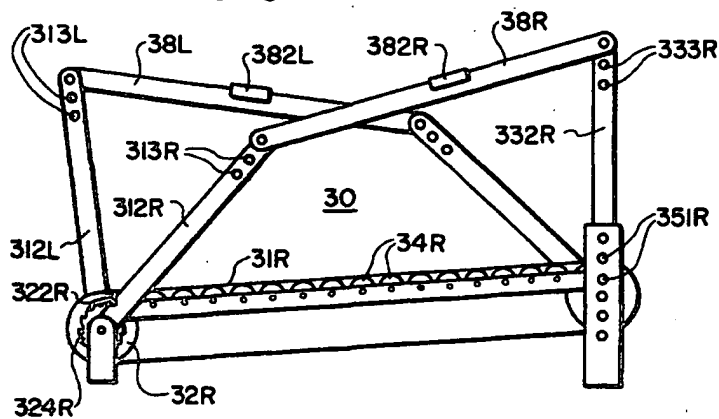


FIG. 4

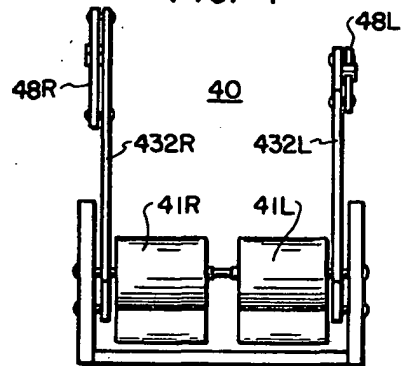


FIG. 5

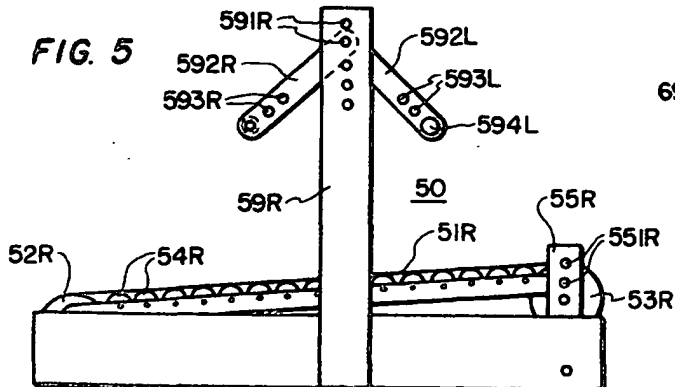
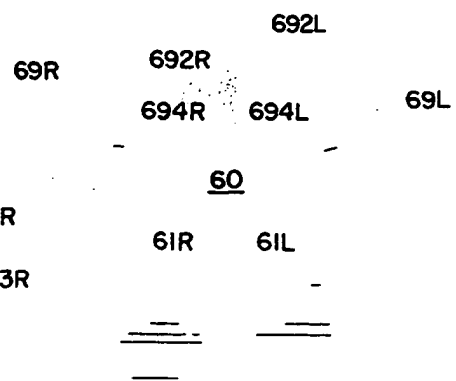


FIG. 6



DUAL-TREAD EXERCISER

BACKGROUND OF THE INVENTION

There are many types of exercisers for both arms and legs. Most of these are of the rope and pulley variety, with weights and/or springs to establish the load on the various limbs. This provides motion and tension of the muscles, but does not, accurately, imitate the process of walking, or provide real therapy in this area. Other exercisers are of the treadmill variety to give the function of walking without moving from a given location. This is often necessary or desirable where there is no convenient place to run or walk; or the weather is inclement; or the individual needs a controlled situation.

However, all of the treadmills have a single tread for both legs, and while they can be controlled in many ways, such as by raising the forward end of the treadmill, to provide a slope to climb against; or by friction mechanism that may provide a variable drag against the progress of the treadmill. Meters and other attachments may be provided to record the speed and the force utilized in the operation of the treadmill. However, none of the available treadmills can vary the load on either of the legs individually—or on the arms of the exerciser.

It is therefore an object of this invention to provide a treadmill having a separate, articulated tread for each of the legs of the user.

It is a further object of this invention to provide a dual treadmill wherein each of the treads can be controlled separately. The treads may, in fact, be controlled by separate motor-generators that may provide a supplemental force to either legs when energy is applied, or provide a given drag to either leg, when a load is applied for therapeutic purposes.

It is a further object of this invention to provide an exercise device that includes separate arm devices as well as separate leg devices that may all be individually controlled to supplement or attenuate the motions of both arms and legs.

SUMMARY OF THE INVENTION

Dual treadmills are provided in an exerciser to provide a separate control on the function of the separate legs of the user. The separate treadmills may provide a separate degree of drag, depending on the need for exercise of the separate legs, or may even be motor driven to reduce the work required of a given leg. Arm braces are also provided to support the user on the treadmills and may be coordinated to permit or require arm motion in conjunction with the leg motion.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows an oblique view of the overall device; FIG. 2 shows an end view of a similar species of the device;

FIG. 3 shows a side view of another species of the device;

FIG. 4 shows an end view of the device of FIG. 3; FIG. 5 shows a side view of still another species of this device; and

FIG. 6 shows an end view of the device of FIG. 5.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now more particularly to FIG. 1, an oblique view is seen of the device 10 having two treads

11L and 11R to separately accommodate the two feed of an individual. The treads are continuous and extend around rollers 12L and 12R at the rear end, and 13L and 13R at the front end. The upper surfaces of the treads are supported by the roller bearings 14L and 14R respectively. The rearmost rollers 12L and 12R are supported at ground level, but the foremost rollers 13L and 13R are elevated on the frame poles 15L and 15R through axels through any of a series of holes such as 151R.

FIG. 2 shows an end view of a similar device 20 with treadmill treads 21L and 21R on rollers 22L and 22R respectively. In this species, motors 27L and 27R are shown connected to the axles of the corresponding rollers for providing individual control of the drive or drag of the corresponding treads.

FIG. 3 shows a side view of another variation of this device, similar to the device of FIG. 1, and with similar elements similarly numbered, but with the addition of braces 38L and 38R, with handles 382L and 382R respectively, for arm support and exercise. These braces are coupled to rear supports 312L and 312R respectively by pivots 313L and 313R respectively. The fore ends of the braces are coupled to supports 332L and 332R by pivots 333L and 333R respectively. The rear supports 312L and 312R are coupled to the toe roller 32R by ratchets 322R and pawls 324R. The foremost rollers axles are set into one of the elevating sockets 351R.

FIG. 4 shows a front view of the device of FIG. 3 with similar elements similarly numbered. The device 40 has the foremost supports 432L and 432R supporting the hand braces 48L and 48R respectively.

FIG. 5 shows another variation of this device with similar elements again similarly numbered. In this species a central post 59R is seen with sockets 591R supporting pivot arms 592R with pivot arm sockets 593R supporting handles 594.

FIG. 6 shows a front view of the device of FIG. 5 with similar elements again similarly numbered. This figure shows more clearly the foremost supports 69L and 69R with pivot arms 692L and 692R supporting handles 694L and 694R respectively.

In operation, the individual stands with one foot on each of the separate treadmills, which may be adjusted to a normal walking resistance. This may be done by a combination of the height of the foremost end—to determine the angle of the slope of the treads—and by the drag or assistance applied to each of the treads. Such drag or assistance may be provided by the motor generators 27L and 27R of FIG. 2, and may be controlled at hand level by controls such as 16L and 16R for applying energy to the motors for assistance, or applying a load to the generators for drag in a well known manner.

The hand braces of FIG. 1 are stationary, and may steady the body while the feet and legs are exercising. However, the species of FIGS. 3 through 6 show variations wherein the arms support the body on moveable handles that may be coordinated with the motion of the corresponding treads to provide—or require—a normal swing of the arms in coordination with the movement of the legs on the treads.

FIGS. 3 and 4 show parallel bars or braces 38 that can move backward and forward. These may be locked in a central position if no motion of the arms is needed or desired, or they may be coupled, through the various supports, to gears the ratchets of well known types of

supplement or coordinate the motion of the arms with that of the legs and feet along the treads.

FIGS. 5 and 6 show another arm-bracing mechanism with handles that may be locked in a central position or may move back and forth in a normal motion to simulate walking. Mechanism, not shown, may be provided here to couple the motion of the pivot arms and the rollers to couple the arm motion to the treads.

The essential feature of this invention is that each treadmill is separate, and can be separately regulated. A uniform treadmill motion can be provided by any of the prior art devices, and would be redundant here. This device performs the unique function of providing separate control of the motion and the work or exercise allotted to each leg, from almost nil to the maximum. This is invaluable for a myriad of problems of individual requiring therapeutic treatment. For example, the effort of one leg can be a negligible amount at the beginning of therapy, and gradually increased to an amount equal to or greater than that of the other leg at the conclusion of the therapy.

The arms may not be used if this is not indicated, or they may be exercised to the extent that they need therapy, from a negligible amount to an exaggerated wing, and this may be coordinating with the motion of the treads. Continuous handrails could be provided and controlled in the same manner as that of the treads, but the simpler, reciprocal mechanism, as shown here, would serve the same purpose.

In any case, both the arm movement and the leg movement can be controlled separately in this device, in any manner or pattern that therapy may suggest, and these movements can be changed or varied at a moment's notice to accommodate another individual with entirely different problems.

It is to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

What is claimed is:

1. An exercising machine comprising a first treadmill having a first continuous tread for the left leg of the user; a second treadmill having a second continuous tread for the right leg of the user; means for supporting said first and second treadmills and treads parallel to, and adjacent to, each other for supporting the weight of the user thereon; a first means for independently controlling the motion of said first treadmill tread; a second means for controlling the motion of said second treadmill tread and operable independently of said first

means; and arm support means extending above the plane of said treads for grasping by the user.

2. An exercising machine as in claim 1 having a means for adjusting the slope of said first and second treadmills.

3. An exercising machine as in claim 1 wherein said first and second means for independently controlling the motions of said treadmill treads comprises a first and a second means for applying friction independently to said first and second treadmills respectively, to vary the drag on each of said treadmill treads separately.

4. An exercising machine as in claim 1 wherein said first and second means for independently controlling the motions of said treadmill treads comprise a first motor-generator connected to said first treadmill; means for controlling said first motor-generator; a second motor-generator connected to said second treadmill; and means for controlling said second motor-generator.

5. An exercising machine as in claim 4 wherein said means for independently controlling said first and second motor generators comprise means for applying current independently to either of said motor-generators to assist the corresponding treadmill and tread.

6. An exercising machine as in claim 4 wherein said means for independently controlling said first and second motor-generators comprise means for applying a load to either of said motor-generators to load the corresponding treadmill.

7. An exercising machine as in claim 1 wherein said arm support means includes first and second hand braces and means for supporting said hand braces with respect to said treadmills.

8. An exercising machine as in claim 7 wherein said hand braces and said means for supporting said hand braces are moveable with respect to each other and with respect to said treadmills.

9. An exercising machine as in claim 8 wherein said means for supporting said first and second hand braces include means associated with each respective hand brace and its associated treadmill wherein the motions of said hand braces are coordinated with the motions of said treadmill treads to simulate arm and leg motion.

10. An exercise machine as in claim 7 having a first means for controlling the motion of said first hand brace with respect to its associated treadmill, and a second means for controlling the motion of said second hand brace with respect to its associated treadmill, to simulate arm motion corresponding to normal leg motion on operation of said treadmill treads.

* * * * *

United States Patent [19]
Magid

[11] **Patent Number:** **5,607,376**
[45] **Date of Patent:** ***Mar. 4, 1997**

[54] **CONVERTIBLE TREADMILL APPARATUS
WITH LEFT AND RIGHT FOOT BELTS**

[76] **Inventor:** **Sidney H. Magid**, 1100 Gough St., No. 10A, San Francisco, Calif. 94109

[*] **Notice:** The term of this patent shall not extend beyond the expiration date of Pat. No. 5,538,489.

[21] **Appl. No.:** **541,599**

[22] **Filed:** **Oct. 10, 1995**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 276,996, Jul. 19, 1994, Pat. No. 5,538,489, which is a continuation-in-part of Ser. No. 236,585, May 2, 1994, abandoned, and Ser. No. 169,143, Dec. 17, 1993, Pat. No. 5,411,279.

[51] **Int. Cl.⁶** **A63B 22/02**

[52] **U.S. Cl.** **482/54; 482/69**

[58] **Field of Search** **482/69, 54; 198/783**

[56] **References Cited**

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5,411,279 5/1995 Magid 482/54

5,538,489 7/1996 Magid 482/54

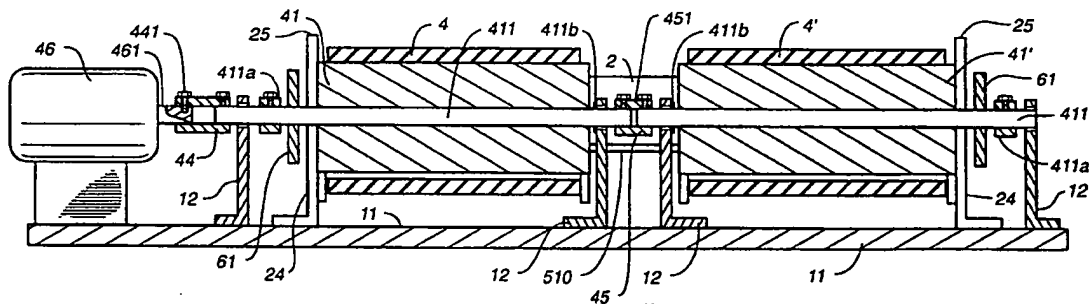
Primary Examiner—Lynne A. Reichard

Attorney, Agent, or Firm—Douglas E. White; Acronational Law Firm

[57] **ABSTRACT**

A treadmill or walker apparatus includes a mounting base, a pair of front rollers mounted fixedly on rotatable left and right front shafts which coaxially extend from a left front side to a right front side of the mounting base, a pair of rear rollers mounted rotatably on at least one rear shaft which extends from a left rear side to a right rear side of the mounting base, endless left and right foot belts engaging respectively one of the front rollers and one of the rear rollers, and a support unit disposed between the front and rear rollers to provide a supporting surface for the foot belts. The foot belts move independently and are to be treaded individually by the feet of the user, thereby preventing the action of the user's left foot from influencing the action of his right foot and vice-versa when the apparatus is in use. The apparatus may be used with a functional supporting frame that is in the form of a baby chair, a baby stroller, an exercise walker or any other suitable form. Disclosed structures include freely moving left and right side belts, fixed-tandem concurrently moving left and right side belts, and the latter moved by a motor.

9 Claims, 4 Drawing Sheets



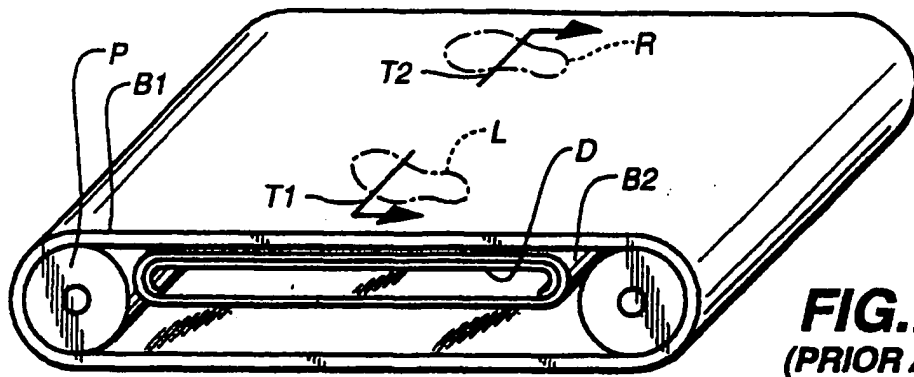


FIG. 1
(PRIOR ART)

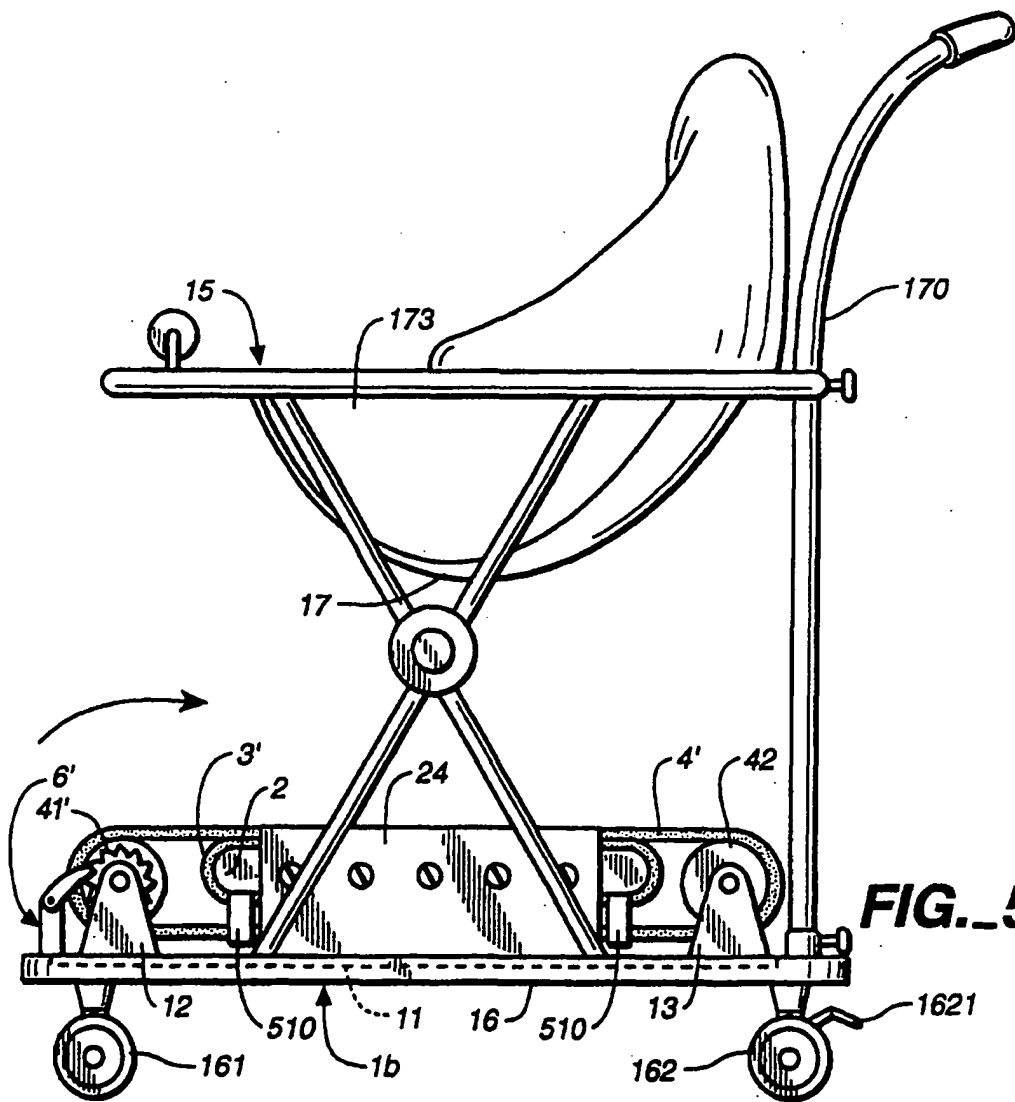
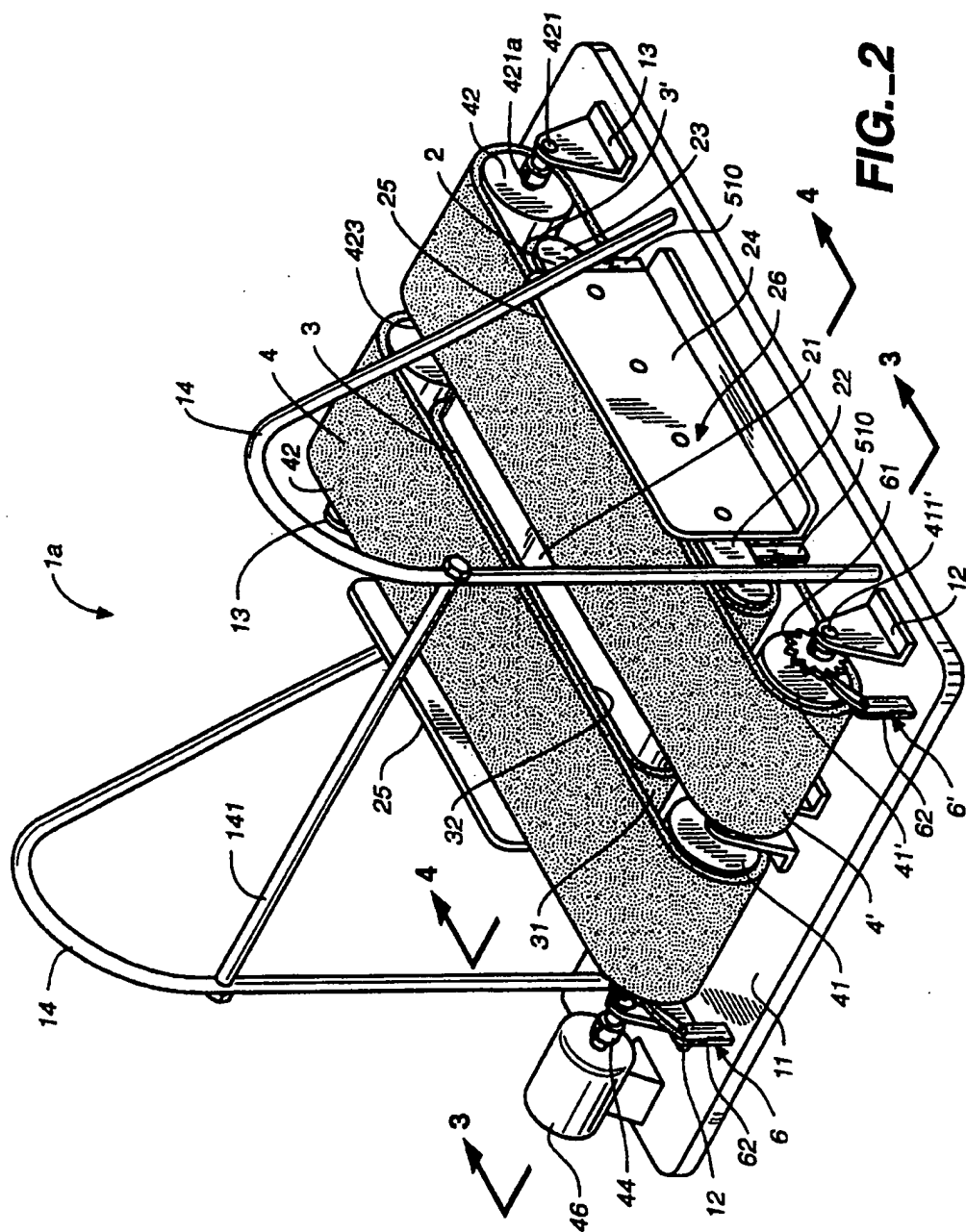


FIG. 5



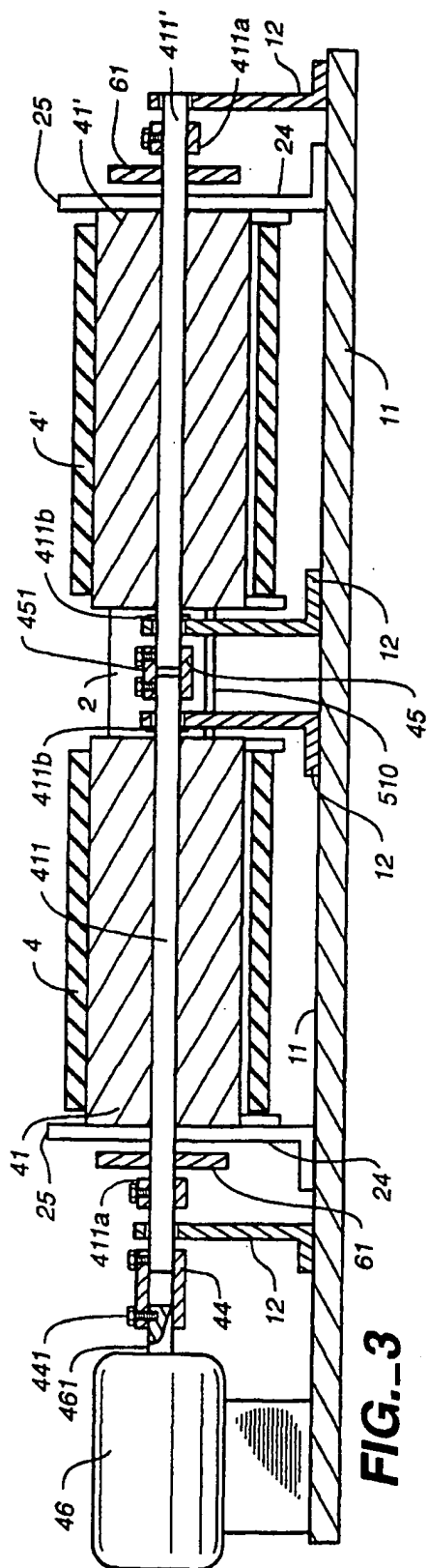


FIG. 3

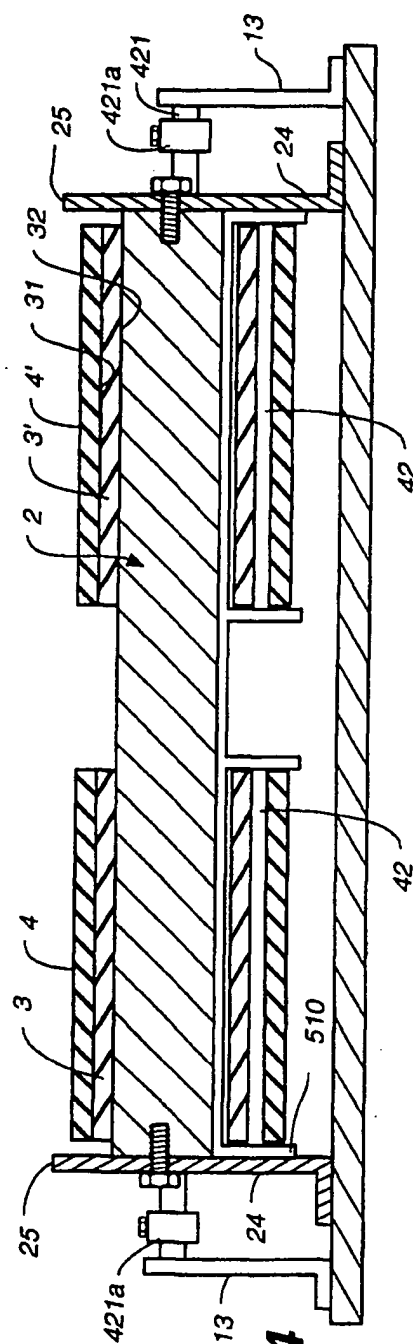


FIG. 4

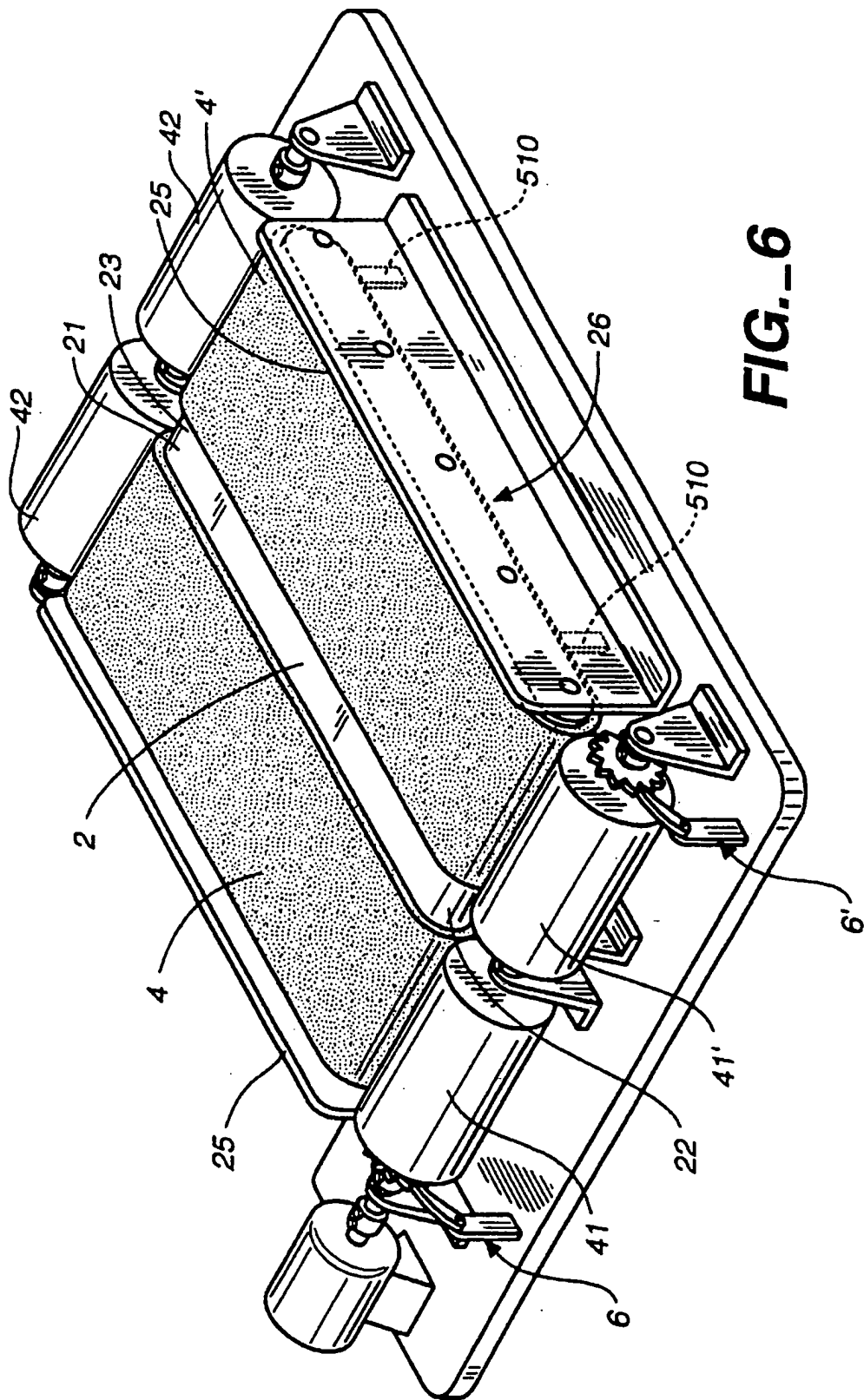


FIG. 6

CONVERTIBLE TREADMILL APPARATUS WITH LEFT AND RIGHT FOOT BELTS

This application is a continuation-in-part application of U.S. pat. application No. 08/276,996 now U.S. Pat. No. 5,538,489, which was filed by the applicant on Jul. 19, 1994, which is a continuation-in-part application of application Ser. No. 08/236,585 filed on May 2, 1994 now abandoned, and which, is a continuation-in-part application of application Ser. No. 08/169,143 filed on Dec. 17, 1993. The latter application issued as U.S. Pat. No. 5,411,279 on May 2, 1995.

FIELD OF THE INVENTION

This invention relates in general to walker apparatuses, more particularly to a convertible treadmill which prevents the action of the user's left foot from influencing the of his right foot and vice-versa when the treadmill apparatus is in use. It further relates to a structure that provides means to convert independent foot belts to belts that move concurrently together in fixed tandem, and to means for motorizing such fixed-tandem belt pairs.

BACKGROUND OF THE INVENTION

Referring to FIG. 1, a running track disclosed in Russian Patent No. 961,712 and issued to Morozov comprises an endless rubberized bearing belt (B1) mounted on pulleys (P) and a support deck (D) under the upper branch of the bearing belt (B1). An inner endless belt (B2) is rounded freely on the support deck (D) and is made of a material which has antifriction properties with respect to the surface of the support deck (D). The running track of Morozov is not suited for use as a treadmill apparatus by people with uncoordinated feet movement, such as small children, physically handicapped people and old people, since the left and right feet of the user both tread a single, wide bearing belt (B1) at the same time. Thus, a twisting moment (T1), (T2) applied by either the left foot (L) or the right foot (R) when treading the left-side or right-side parts of the bearing belt (B1) may influence smooth running of the latter relative to the inner endless belt (B2).

U.S. Pat. No. 4,204,673 to Spcer, Sr., discloses a dual-tread exerciser which uses a large plurality of parallel roller bearings to support the treads. Such roller bearings have proven to be uncomfortable on the feet and are not suited for use by children and others having sensitive feet or who desire a more comfortable feel, particularly when exercising barefoot. Two motors are required to motorize the device of Spcer, Sr.

SUMMARY OF THE INVENTION

Therefore, an object of the present invention is to provide a dual-belt treadmill or walker apparatus which prevents the action of the user's left foot from influencing the action of his right foot and vice-versa when the apparatus is in use and which is convertible for use in the manner of a single-belt device.

More specifically, one object of the present invention is to provide a treadmill apparatus with left and right foot belts that move independently and that are to be treaded respectively by the right and left feet of the user, thereby preventing the action of the user's left foot from influencing the action of his right foot and vice-versa when the treadmill apparatus is in use. (Note that in accordance with accepted drawing conventions, left and right portions of an apparatus

are labeled according to the viewer's perspective when facing the front of the device or when reading the drawing. Accordingly, when a user mounts the apparatus, his or her right foot contacts what will be called herein the left belt. Similarly, the user's left foot contacts the right belt.)

Another objective of the present invention is to provide means for convening such a treadmill or walker apparatus back to the conventional state wherein the left and right foot belts again move in fixed tandem. Users may desire such convertibility, for example, in such cases as a child growing older and becoming able to coordinate foot movements, a patient becoming well and regaining such coordination, and the like. Accordingly, the treadmill apparatus or treadmill has the facing end portions of each separate front shaft extending toward each other beyond the brackets on which the front shafts are mounted. A small space is provided between the ends of said shafts. Journaled over the facing shaft ends is a cylindrical collar having set screws or equivalent collar fixing means at each end thereof. Preferably the collar is slidably mounted on one shaft end so it can be slid to engage the end of the shaft extending toward it. The tightening of the set screws onto the shafts ends will connect, or gang, the left and right rollers together, causing them to move together at the same time, in fixed tandem. Alternatively, one end of the collar may be more or less permanently fixed to one shaft (by welding, set screw or the like) and the opposite free end thereof arranged always to extend over and around the other shaft. Tightening a set screw on the free end gangs the shafts (and thereby the belts) in fixed tandem. Loosening the collar fixing means frees them for independent rotation—without the need to slide the collar back and forth.

Yet another objective is to provide means for motorizing the treadmill apparatus when in the fixed-tandem belt state. Accordingly, the other end of one of the front shafts extends beyond the outboard bracket on which it is mounted. An electric motor is mounted on said mounting base with the motor shaft spaced slightly from and aligned coaxially with the front roller shaft that extends beyond its outboard bracket. Mounted on the motor shaft is a second collar with a set screw or equivalent collar fixing means at each end thereof, which collar can be slid to engage the end of the roller shaft extending toward it. The tightening of the set screws on the motor shaft collar will cause the left and right rollers to turn together concurrently in tandem when the motor is energized. In addition to being well suited for general exercise, this embodiment is useful for treating injuries and certain kinds of illnesses wherein the patient needs to be assisted in walking, or indeed, to be forced to walk in order to recuperate.

Another objective of the present invention is to provide a treadmill apparatus which may be used with any of a number of functional supporting frames, such as the functional supporting frame of an exercise treadmill or walker. The latter has an adjustable hand bar for use by small children, physically handicapped people, old people and by those who feel more confident holding onto something while exercising.

Still another objective of the present invention is to provide a treadmill apparatus which may be used with the functional supporting frame of a baby stroller or a baby chair so as to provide a safe and effective way for exercising a baby and for teaching the baby to stand and walk.

Accordingly, the treadmill apparatus of the present invention comprises a mounting base, a pair of front rollers, a pair of rear rollers, endless left and right foot belts, and a support

means. The mounting base has left and right front sides, independently rotatable left and right front shafts extending along a common transverse axis from the left front side to the right front side of the mounting base, left and right rear sides, and a rear shaft extending from the left rear side to the right rear side. The front rollers are mounted fixedly on the front shafts and are disposed respectively on the left and right front sides of the mounting base. The rear rollers are mounted rotatably on the rear shaft and are disposed respectively on the left and right rear sides of the mounting base. Each of the foot belts engages a respective one of the front rollers and a respective one of the rear rollers. The support means is disposed between the pair of front rollers and the pair of rear rollers and provides a supporting base or surface for the foot belts. Thus, the presence of weights (i.e., feet) which move separately on the foot belts between the pair of front rollers and the pair of rear rollers will cause the foot belts to move and the front and rear rollers to rotate.

The mounting base may further have two pair of spaced front brackets disposed adjacent to the left and right front sides thereof and in the front middle thereof and a pair of spaced rear brackets disposed adjacent to the left and right rear sides thereof. The front shafts each have two ends turning within a pair of front brackets, while the rear shaft has two ends fixed respectively to the two rear brackets. The front shafts each have retainers at two opposite end portions to limit lateral movement of the front shafts. The rear shaft has a central portion provided with a collar or like spacer to separate the rear rollers, and two opposite end portions provided with spacers, collars or similar known retainers to limit lateral movement of the rear rollers.

Each of the front rollers may have an outer end with a ratchet gear attached thereto. The mounting base further has a pair of pawls which releasably engage the ratchet gears on the front rollers.

In one embodiment of the treadmill apparatus of the present invention, each of the endless left and right foot belts has a frictional inner surface and is wound circulatively on the respective one of the front rollers and on the respective one of the rear rollers. The support means comprises an elongate solid substrate base and endless left and right inner belts. The substrate base is secured on the mounting base and has left and right sides, a flat slippery top surface and two arcuate ends, which ends continue the slippery top surface. The inner belts are wound circulatively on the arcuate ends of the substrate base and are disposed respectively on the left and right sides of the substrate base. Each of the inner belts has a slippery inner surface that contacts the substrate base and a frictional outer surface that contacts the frictional inner surface of a respective one of the foot belts. The substrate base further has a downwardly projecting guide bracket which separates the inner belts and the foot belts and limits their lateral movement. The substrate base is held up by brackets which have a short pair of upwardly projecting flanges that extend on opposite longitudinal edges of the substrate base.

In a further embodiment of the treadmill apparatus of the present invention, the support means comprises a substrate base secured on the mounting base and having a slippery top surface. Each arcuate end of the substrate base continues the slippery outer top surface. Each of the foot belts has a slippery inner surface that contacts the substrate base and substrate base ends, and has a frictional outer surface. Each of the foot belts is wound around the substrate base and passes between and is in operating contact with one of the front rollers and the front substrate base end. Each foot belt further passes between and is in operating contact with one

of the rear rollers and the rear substrate base end. The substrate base further has a downwardly projecting guide bracket which separates and limits the travel of the foot belts, and a pair of upwardly projecting bracket flanges which extend on opposite longitudinal edges of the substrate base.

Any one of the different embodiments of the treadmill apparatus of the present invention may further comprise the functional supporting frame of an exercise walker, a baby chair or a baby stroller. When used as an exercise device, the treadmill or walker apparatus is an ideal way of losing weight and keeping fit. When used as a baby chair or baby stroller, the apparatus provides a safe and effective way for exercising a baby and for teaching the baby to stand and walk.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with reference to the accompanying drawings, of which:

FIG. 1 illustrates a conventional running track which uses outer and inner endless belts;

FIG. 2 is a perspective view of the first preferred embodiment of a treadmill apparatus according to the present invention, the first preferred embodiment being attached to a first example of a functional supporting frame so as to serve as an exercise treadmill or walker;

FIG. 3 is a schematic sectional view of FIG. 2 taken along line 3—3;

FIG. 4 is a schematic sectional view of FIG. 2 taken along line 4—4;

FIG. 5 is a schematic side view of the first preferred embodiment when attached to a second example of a functional supporting frame so as to serve as a combined baby stroller (or chair) and walker;

FIG. 6 is a perspective view of the second preferred embodiment of a treadmill apparatus according to the present invention.

Drawing Reference Numerals

B1	bearing belt
B2	inner belt
P	pulleys
D	deck
R	right foot
L	left foot
T1	moment
T2	moment
1a	functional supporting frame
1b	functional supporting frame
11	mounting base
12	front brackets
13	rear brackets
14	handrails
141	handbar
15	upper frame portion
16	lower frame portion
161	front wheels
162	rear wheels
1621	brake
17	baby seat
170	removable handle unit
173	leg holes
2	substrate base
21	slippery top surface
22	front end
23	rear end

Drawing Reference Numerals	
24	side brackets
25	flanges
26	support unit
3	left inner belt
3'	right inner belt
31	frictional outer belt surface
32	slippery inner belt surface
4	left foot belt
4'	right foot belt
41	left front roller
41'	right front roller
411	left front shaft
411'	right front shaft
411a	retainers
411b	spring clip rings
42	rear rollers
421	rear shaft
421a	retainers
423	spacer
44	second collar
441	set screws
45	first collar
451	set screws
46	motor
461	motor shaft
510	guide bracket
6	left unidirectional control means
6'	right unidirectional control means
61	ratchet gears
62	pawls

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Before the present invention is described in greater detail, it should be noted that like elements are indicated by the same reference numerals throughout the disclosure. Furthermore, as noted above, "left" and "right" are conventionally described with respect to a frontal view of the apparatus as seen in the drawing. When a user mounts the apparatus, his or her perspective is reversed, i.e., the user's left foot is placed on the what nevertheless will be called herein the right side of the apparatus and the user's right foot is placed on what will be called the left side thereof.

Referring to FIGS. 2 to 4, the first preferred embodiment of a treadmill apparatus according to the present invention is shown to comprise a mounting base 11; a pair of left and right front rollers 41, 41'; a pair of rear rollers 42; endless left and right foot belts 4, 4'; and a support unit 26. The mounting base 11 has a pair of spaced front brackets 12 disposed adjacent to left and right front sides of the mounting base 11; a left front shaft 411 which extends from the left front side to the front mid-portion and which has two ends rotatably journaled respectively within a first pair of front brackets 12; a right front shaft 411' which extends coaxially with the left front shaft 411 from the front mid-portion to the right front side and which has two ends rotatably journaled respectively within a second pair of front brackets 12; a pair of spaced rear brackets 13 disposed adjacent to the left and right rear sides of the mounting base 11; and a rear shaft 421 which extends from the left rear side to the right rear side and which has two ends secured on the rear brackets 13.

The left and right front rollers 41, 41' are mounted fixedly on the rotatable front shafts 411, 411' and are disposed respectively on the left and right front sides of the mounting base 11. The fixed-roller front shafts 411, 411' are further provided, immediately adjacent to brackets 12, with a plurality of shaft retainers 411a in amounts and at positions

commonly known in the art to be appropriate for limiting lateral movement of the shafts within their brackets. For clarity of illustration, only two schematic retainers 411a are shown in the broadly schematic view of FIG. 3. Other types of suitable shaft retainers would include spring clips fitting in circumferential grooves in the shafts. For example, conventional spring clip rings 411b are appropriate in narrow spaces, such as at the inboard ends of the rollers 41, 41'. In practice, retainers 411a will be mounted immediately adjacent to brackets 12, to minimize transverse play.

The rear rollers 42 are mounted rotatably on the fixed rear shaft 421 and are disposed respectively on left and right rear sides of the mounting base 11. An appropriate conventional bearing, collar or loose spacer 423 (hidden in the drawing) is mounted rotatably on a central portion of the rear shaft 421 to separate the rear rollers 42. The rear shaft 421 is further provided with a pair of retainers 421a on two opposite end portions thereof to limit lateral movement of the rear rollers 42. Retainers 421a may further be augmented or replaced with collars, spacers, clip rings, or similar loose fittings, whose shapes and functions are well known in the art, with which to limit side to side movement of the rear rollers 42.

In order for the apparatus to function in accordance with the objectives of this invention, the front rollers 41, 41' must be immovably fixed to a pair of rotatable front shafts 411, 411'. However, the rear rollers 42 might be rotatable about a single fixed rear shaft (as drawn and described), might be rotatable about a single rotatable rear shaft, might be fixed to a pair of rotatable rear shafts, might be rotatable about a pair of fixed rear shafts, or might be made independently rotatable by any other such rear shaft means. Preferably, the rear shaft 421 is screwed in place on the brackets 13. Were rear shaft 421 to be made rotatable, suitable collars, retainers or other common mechanisms would be added as appropriate to restrain it and its associated rollers from lateral travel. To allow for some lateral play, a rotatable rear shaft would likely have its ends extend somewhat out beyond their respective brackets, as would all front shaft ends.

Each of the foot belts 4, 4' engages a respective one of the front rollers 41, 41' and a respective one of the rear rollers 42. In this embodiment, the foot belts 4, 4', are wound circumlucively on the respective one of the front rollers 41, 41' and on the respective one of the rear rollers 42.

Turning now to the sectional detail shown in FIG. 3, roller shafts 411, 411' have journaled around their adjacent coaxial inboard ends a first hollow cylindrical collar 45. Collar fixing means, preferably comprising a pair of set screws 451, allows the first collar to be releasably secured to the inboard ends. When the collar fixing means is engaged by tightening the set screws 451, the shafts 411, 411' are ganged together so as to cause the front rollers 41, 41' to move simultaneously together in fixed tandem. However, in normal operation of the device, independent travel of the front rollers is desired, in which case one of the set screws 451 is loosened. This frees one shaft end from the collar 45 and releases the front shafts for independent rotation. Preferably, to prevent any friction between the collar 45 and the free shaft end, both set screws 451 will be loosened and the collar slid to one side or the other so as to clear the small gap between the inboard ends of the shafts 41, 41'. Note that for clarity of illustration, the collar 45 has been drawn slightly elongated. In actual practice, it will be short enough to be easily slid back behind the shaft end gap.

When the treadmill apparatus is in the ganged or fixed-tandem belt state described above (the collar 45 being

rigidly fixed to both front shafts 411, 411'), it may be desirable in certain applications to motorize the operation of the foot belts 4, 4' through the activation of the electrical motor 46. This may be accomplished by means of a second hollow cylindrical collar 44 or equivalent shaft-ganging means. The motor 46 is mounted on a suitable extension of the mounting base 11 and has a motor shaft 461 aligned coaxially with and spaced slightly apart from the outboard end of the left front shaft 4 11, which outboard end projects laterally outward from its associated outboard bracket 12. The second collar 44 can be slid toward and over the adjacent end of the left roller shaft 4 11, as shown, and both set screws 441 tightened. The tightening of all set screws 441, 451 on both collars 44, 45, respectively, will cause the left and right front rollers 41, 41' to turn together concurrently in fixed tandem, and thereby the belts 4, 4' as well, when the motor 46 is energized.

As noted above, in the presently preferred mode of operation, the collars 44, 45 will be loosened on at least one end each thereof so that the foot belts 4, 4' may be operated manually and independent of each other by the feet of the user.

Referring again in general to FIGS. 1-4, a unidirectional control means 6, 6' is installed to permit only unidirectional rotation of the left and right foot belts 4, 4'. In this embodiment, the control means 6, 6' includes a pair of ratchet gears 61 attached to or near outer ends of the front rollers 41, 41' and mounted fixedly on the left and right shafts 411, 411'. It further includes a pair of pawls 62 secured to the mounting base 11 and engaging one of the ratchet gears 61. This permits only unidirectional rotation of the front rollers 41, 41', thereby preventing bi-directional movement of the foot belts 4, 4'. A pawl release means (not shown), chosen from of a number of available conventional pawl and ratchet designs, may be provided to release selectively the pawls 62 from the ratchet gears 61 in a known manner, to permit reciprocating movement of the foot belts 4, 4'. This could be done when it is desired, for example, to use the apparatus as a ski exerciser. Of course, the ratchet gears may be attached to the rear rollers 42 to achieve the same result.

The support unit 26 is disposed between the pair of front rollers 41, 41' and the pair of rear rollers 42 and provides a substantially flat supporting surface or base for the foot belts 4, 4'.

In this embodiment, the support unit 26 includes an elongate substrate base 2, preferably of thick solid construction, secured on a pair of side brackets 24 that extend upwardly from opposite longitudinal sides of the mounting base 11. The unit further includes endless left and right inner belts 3, 3' wound respectively on left and right sides of the substrate base 2. The pair of brackets 24 (or, alternatively, the substrate base 2) has a pair of flanges 25 extending upwardly only about 1/4 inch along opposite longitudinal edges of the substrate base (the extent of such extension being exaggerated somewhat in the drawing). Inwardly-directed narrow strips or fillets could be added to, or in place of, the flange extensions 25 to fill in substantially all of the small gap between the flanges 25 and the outer edges of belts 3, 3', 4, and 4' (FIG. 4). Such filler strips would serve as means to limit lateral movement of the inner belts 3, 3' and the foot belts 4, 4'.

The substrate base 2 has a flat slippery top surface 21 and arcuate front and rear ends 22, 23. The inner belts 3, 3' are wound circulatively on the arcuate front and rear ends 22, 23 of the substrate base 2 and are disposed respectively on left and right sides of the substrate base 2. Each of the inner belts

3, 3' has a slippery inner surface 32 that contacts the top surface 21 of the substrate base 2, and a frictional outer surface 31 that contacts a respective one of the foot belts 4, 4'. Each of the foot belts 4, 4' has frictional inner and outer surfaces and an upper branch which overlaps the respective one of the inner belts 3, 3'. The inner belts 3, 3' of this embodiment comprise one means associated with the foot belts 4, 4' to provide slippery contact with the TEFLON-coated or silicone-coated substrate-base top surface 21.

Affixed across the bottom of the substrate base 2 is an downwardly projecting guide bracket 510 which groups and separates by left group and right group the inner belts 3, 3' and the foot belts 4, 4'. The bracket 510 is the preferred means to limit lateral movement of the belt groups. Preferably, however, for safety purposes, as well as to provide an attractive overall appearance, moving parts (other than the intended contact portions of the belts) and other delicate or dangerous parts will be protected with appropriate molding covers and facing strips. For example, a thin flat strip should be placed on the top of the substrate base 2 in the gap between the belt groups. Covers for the belt ends would be appropriate at the ends of the substrate base 2. Such moldings could contain further means to limit lateral movement of the belts.

When in use, the user's feet drive a respective foot belt 4, 4', rather than a single, common wide belt as taught in the conventional running track described beforehand. Thus, the foot belts 4, 4' move independently when treaded by, respectively, the right and left feet of the user, thereby preventing the action of the user's left foot from influencing the action of his right foot and vice-versa to permit natural, comfortable and a more ergonomic form of walking when the treadmill apparatus of the present invention is in use.

When the user applies a moving weight, such as his feet, on the left and right foot belts 4, 4' between the pair of front rollers 41, 41' and the pair of rear rollers 42, the foot belts 4, 4' will drive frictionally the rollers 41, 41', 42. Due to the slippery top surface 21 of the substrate base 2 and the slippery inner surface 32 of the inner belts 3, 3' and due to the frictional outer surface 31 of the inner belts 3, 3' and the frictional inner surface of the foot belts 4, 4', the foot belts 4, 4' and the inner belts 3, 3' slide smoothly on the substrate base 2 when the user treads on the foot belts 4, 4'. The frictional outer surface of the foot belts 4, 4' ensures traction with the user's feet so as to enable the foot belts 4, 4' to be driven properly.

It is noted that the arcuate ends 22, 23 of the substrate base 2 may be replaced by two coaxial pairs of rollers (not shown) to achieve a similar effect in any of the embodiments of the invention.

Referring once more to FIG. 2, the mounting base 11 is attachable to a functional supporting frame 1a. In this embodiment, the functional supporting frame 1a comprises a pair of handrails 14 mounted on opposite longitudinal sides of the mounting base 11 to permit use of the walker apparatus as an exercise treadmill. The handrails 14 are generally of an inverted V-shape. A hand bar 141 extends between the handrails 14 and has two ends connected adjustably along one side of each of the handrails 14 in a known manner. The walker apparatus is thus ideal for use by small children, physically handicapped people, old people and by those who feel more confident holding onto something while exercising. This form of an exercise treadmill is well suited for emplacement in hospitals and in retirement homes, and is ideal for use by those who wish to keep fit and lose weight.

Referring to FIG. 5, the first preferred embodiment may be attached to a functional supporting frame 1b that is in the form of a baby stroller. The functional supporting frame 1b comprises an upper frame portion 15; a lower frame portion 16 provided with front and rear wheels 161, 162 and connected to the mounting base 11 to support the mounting base 11 under the upper frame portion 15; and a baby seat 17 secured to the upper frame portion 15. The functional supporting frame 1b may be provided with a removable handle unit 170, which is attached removably to the upper and lower frame portions 15, 16 for pushing the functional supporting frame 1b. Furthermore, the front wheels 161 may be provided with a respective swivel which is rotatable about longitudinal axes of supporting legs of the front wheels 161 in a known manner. The rear wheels 162 may be provided with a respective brake 1621. As can readily be seen, with the handle 170 removed and with the wheels 161 either locked with the brake 1621 or removed, the functional supporting frame 1b serves as a stationary baby chair having an integral walker. Ratchet gears with pawls (unidirectional control means 6') can aid in proper walking.

When the first preferred embodiment is used with the functional supporting frame 1b a pair of leg holes 173 formed in the baby seat 17 permits the legs of a baby to extend toward the mounting base 11 so as to tread the foot belts 4, 4'. A baby thus can be taught to stand and walk with the use of the walker apparatus of the present invention. Unlike the conventional wheeled open-bottom baby walker, the present invention is safe to use since the baby is prevented from moving around the room and from bumping into furniture or from falling down the stairs. The functional supporting frame 1b may be further provided with safety belts (not shown) for strapping the baby thereon.

Referring to FIG. 6, the second preferred embodiment of a treadmill apparatus according to the present invention is shown to be substantially similar to the first preferred embodiment. In this embodiment, the support unit 26 comprises a substrate base 2, preferably solid, secured on the mounting base 11 and having a slippery top surface 21. However, no endless inner belts are employed in the second preferred embodiment. Each of the foot belts 4, 4' is wound around the substrate base 2 and passes between and is in operating contact with one of the front rollers 41, 41' and with the front arcuate substrate base end 22. Each further passes between and is in operating contact with one of the rear rollers 42 and with the rear arcuate substrate base end 23. Each of the foot belts 4, 4' has an outer surface which is made of a friction material, such as rubber, to provide traction with the user's feet, and an inner surface which is made of a slippery material, such as a TEFLON-coated or silicone-coated material, to contact the substrate base the foot belts 4, 4' have different properties, each of the foot belts 4, 4' may be in the form of a laminate, the layers of which may be joined in any suitable fashion, such as by sewing, gluing and the like. Alternatively, a TEFLON, silicone, or like slippery coating may be applied directly on the inner surfaces of the foot belts 4, 4' to achieve the same effect. The slippery inner surface of the foot belts 4, 4' of this embodiment comprises alternative means associated with the foot belts to provide slippery contact with the silicone-coated substrate-base top surface 21.

As with the first preferred embodiment, the substrate base 2 further has at least one guide bracket 510 which separates the foot belts 4, 4', and a short pair of upwardly extending flanges 25, preferably on the side brackets 24, which flanges extend along opposite longitudinal edges of the belts. With suitable attached filler strips, the flanges 25 could be used to further limit lateral movement of the foot belts 4, 4'.

Like the previous embodiments, the second preferred embodiment can also be installed with either of the previously described functional supporting frames 1a or 1b. The operation of the second preferred embodiment is substantially similar to that of the first preferred embodiment and will not be detailed further.

While the term "convertible" is used to describe the preferred embodiments of the present invention, each of three kinds of apparatus are intended to be covered herein and in the claims hereto as separate and combination structures, namely, freely moving left and right side belts, fixed-tandem concurrently moving left and right side belts, and the latter moved by a motor.

While the present invention has been described in connection with what is considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements. As just one example, the front and rear roller pairs of each embodiment could have means for increasing or decreasing the distance between them longitudinally so as to stretch or relax the belts and so vary the effort required to operate the apparatus. As another example, the coating on the substrate base may consist of a material, such as paper, coated with a suitable slippery substance. Such paper may be attached to the top of the substrate base, forming the slippery top surface thereof, and could be easily replaced if it should wear out.

I claim:

1. Treadmill apparatus including:

a mounting base attachable to a functional supporting frame, said mounting base having first and second mounting base ends;

first and second rollers transversely mounted coaxially one on each side of said first mounting base end with each said first and second roller fixedly mounted on separate first and second shafts, which said first and second shafts turn in first and second bracket pairs, respectively, one said bracket pair for each said first and second shaft, said first and second bracket pairs being mounted on said first mounting base end;

third and fourth rollers mounted rotatably on at least one third transverse shaft extending from side to side on said second mounting base end with said third shaft mounted in at least one third pair of brackets at said second mounting base end, all said roller shafts being mounted with their axes parallel to the axes of the others;

endless first and second foot belts, said first foot belt engaging said first and third rollers, said second foot belt engaging said second and fourth rollers;

support means for said foot belts comprising a flat-topped substrate base with arcuate ends, said substrate base disposed longitudinally between said rollers between said mounting base ends, said substrate base being secured to said mounting base by means of side substrate base brackets, said substrate base with said arcuate ends having a slippery top surface, and

means associated with said foot belts to provide slippery contact with said slippery substrate-base top surface, whereby movements of said first and second foot belts will coincide with the turning of said first and third rollers and said second and fourth rollers, respectively.

2. The apparatus of claim 1 wherein:

said slippery contact providing means includes

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each of said first and second foot belts having an outer frictional foot-belt surface and an inner frictional foot-belt surface, which said inner frictional foot-belt surfaces engage, respectively, said first and third rollers and said second and fourth rollers by being wound circulatively around each said respective roller and around said substrate base; and
 endless first inner and second inner belts under, respectively, said first and second foot belts, each said first and second inner belts having a frictional outer inner-belt surface in contact with said frictional inner foot-belt surfaces of said first and second foot belts, respectively, and having slippery inner inner-belt surfaces in contact with said slippery substrate-base top surface, said inner belts being wound circula-
 tively around said substrate base and around said arcuate substrate-base ends;
 and further including
 means to limit lateral movement of said foot belts and said inner belts across said substrate base.
 3. The apparatus of claim 2 further including:
 facing first and second inner end portions of said first and second shafts, respectively, said inner shaft-end portions extending coaxially toward each other beyond the brackets of said first and second bracket pairs on which their said first and second shafts are mounted and said inner shaft-end portions having a small space between them; and
 a first collar having a first collar fixing means, which first collar is mounted on one of said first and second inner shaft-end portions so said first collar can releasably engage the other of said first and second inner shaft-end portions, whereby the engaging of said first collar fixing means onto said inner shaft-end portions will cause said first and second rollers to move concurrently in fixed tandem.
 4. The apparatus of claim 3 further including:
 an outer end portion of one of said first and second shafts, which outer shaft-end portion extends beyond the bracket of said first and second bracket pairs on which it is mounted;
 an electric motor mounted on said mounting base and having a motor shaft coaxially spaced slightly apart from said outer shaft-end portion; and
 a second collar having a second collar fixing means, one at each second-collar end, said second collar being mounted on said motor shaft so said second collar can releasably engage said outer shaft-end portion, whereby the engaging of second collar fixing means onto said inner shaft-end portions and onto said motor shaft and said outer shaft-end portion, respectively, will cause said first and second rollers to turn concurrently in fixed tandem when said motor is energized.
 5. The apparatus of claim 2 further including:
 a pair of ratchet gears attached in operative engagement one each with either said first and second rollers or said third and fourth rollers; and
 a pair of pawls located on said mounting base which releasably engage said pair of ratchet gears.
 6. The apparatus of claim 1 wherein:
 said slippery contact providing means includes

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each of said first and second foot belts having an outer frictional foot-belt surface and an inner slippery foot-belt surface that contacts said slippery substrate-base top surface, said outer frictional foot-belt surfaces of said first and second foot belts engaging, but not winding around, said first and third rollers and said second and fourth rollers, respectively, and winding around both arcuate substrate-base ends, whereby, due to close positioning of each said roller to respective said arcuate substrate-base ends, said inner slippery foot-belt surface of each foot belt contacts and freely turns around said slippery arcuate substrate-base ends, and said outer frictional foot-belt surfaces frictionally engages and turns said rollers, so that said first foot belt will turn together with said first and third rollers and said second foot belt will turn with said second and third rollers;
 and further including
 means to limit lateral movement of said belts across said substrate base.
 7. The apparatus of claim 6 further including:
 an outer end portion of one of said first and second shafts, which outer shaft-end portion extends beyond the bracket of said first and second bracket pairs on which it is mounted;
 an electric motor mounted on said mounting base and having a motor shaft coaxially spaced slightly apart from said outer shaft-end portion; and
 a second collar having a second collar fixing means, one at each second-collar end, said second collar being mounted on said motor shaft so said second collar can releasably engage said outer shaft-end portion, whereby the engaging of second collar fixing means onto said inner shaft-end portions and onto said motor shaft and said outer shaft-end portion, respectively, will cause said first and second rollers to turn concurrently in fixed tandem when said motor is energized.
 8. The apparatus of claim 7 further including:
 an outer end portion of one of said first and second shafts, which outer shaft-end portion extends beyond the bracket on which it is mounted;
 an electric motor mounted on said mounting base and having a motor shaft coaxially spaced slightly apart from said outer shaft-end portion; and
 a second collar having a second pair of set screws, one at each second-collar end, said second collar being slidably mounted on said motor shaft so said second collar can be slid to engage said outer shaft-end portion, whereby the tightening of said first and second set screw pairs onto said inner shaft-end portions and onto said motor shaft and said outer shaft-end portion, respectively, will cause said first and second rollers to turn concurrently in fixed tandem when said motor is energized.
 9. The apparatus of claim 6 further including:
 a pair of ratchet gears attached in operative engagement one each with either said first and second rollers or said third and fourth rollers; and
 a pair of pawls located on said mounting base which releasably engage said pair of ratchet gears.

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